

## Appendix B

## Decontamination of Specific Items

This appendix lists more than two dozen specific surfaces or materials, and explains briefly how to best decontaminate each for chemical, biological, or nuclear contamination. The best method of decon for a particular surface or material in a given situation could be any of those listed for that surface or material. The order in which the methods are listed does not indicate preference of one over another.

You should choose the best method for decon of a particular item. The chapters in this manual cover decon methods for personnel, equipment, terrain, and so forth. For a more in-depth understanding of the decon methods you will need, refer to chapters 4 through 10. You will then be able to choose the best method for your particular decon problem, and include needed information in your units standard operating procedure.

Surface or Material	Type of Contamination		
	Chemical	Biological	Nuclear
<b>Asphalt:</b> Roads (Applicable to small vital areas only)	<ul style="list-style-type: none"> <li>● Flush with water.</li> <li>● Spray with slurry from PDDE.</li> <li>● Cover with STB; when liquid contamination is visible and personnel are nearby, use dry mix.</li> <li>● Weather.</li> <li>● Cover small areas or paths across roads with 10 cm (4 inches) of earth.</li> </ul>	<ul style="list-style-type: none"> <li>● Weather. (Remain masked.)</li> <li>● Wet with water (will help prevent secondary aerosols, but does not decon).</li> <li>● Apply 2% household bleach solution.</li> <li>● Spray with slurry from PDDE.</li> <li>● Pour, spray, or spread oil on surface (will help prevent secondary aerosol, but does not decon).</li> </ul>	<ul style="list-style-type: none"> <li>● Brush or sweep.</li> <li>● Flush with water (this may drive some of the contamination into the surface; waste must be controlled).</li> <li>● Vacuum cleaning.</li> </ul>
<b>Roofs</b>	Same as for asphalt roads.	<ul style="list-style-type: none"> <li>● Same as for asphalt roads.</li> <li>● Apply detrochlorite (leave on at least 30 minutes, then flush with water.)</li> </ul>	Same as for asphalt roads.
<b>Brick &amp; Stone:</b> Roads (Applicable to small vital areas only)	<ul style="list-style-type: none"> <li>● Weather.</li> <li>● Spray with slurry from PDDE or apply with brushes and brooms. Let remain 24 hours, then flush with water.</li> <li>● Wash with soapy water, preferably hot.</li> <li>● Cover small areas or paths across roads with 10 cm (4 inches) of earth.</li> </ul>	Same as for asphalt roads.	<ul style="list-style-type: none"> <li>● Same as for asphalt roads.</li> <li>● Abrasion (sand blasting). This provides direct and complete removal of contaminated dust; however, sand and equipment being used becomes contaminated.</li> </ul>
<b>Buildings</b>	<ul style="list-style-type: none"> <li>● Spray with slurry from PDDE or apply with brushes and brooms. Let remain 24 hours, then flush with water.</li> <li>● Use STB or dry mix around buildings where waste water runs.</li> <li>● Wash with soapy water, preferably hot.</li> <li>● Weather.</li> </ul>	<ul style="list-style-type: none"> <li>● Same as for asphalt roads.</li> <li>● Apply STB slurry to vertical surfaces by manual means or PDDE. Slurry may be left on exteriors..</li> </ul>	Same as for brick and stone roads.
<b>Concrete:</b> Roads (Applicable to small vital areas only)	<ul style="list-style-type: none"> <li>● Spray with slurry from PDDE.</li> <li>● Cover with STB or dry mix.</li> <li>● Weather.</li> <li>● Cover small areas or paths across roads with 10 cm (4 inches) of earth.</li> </ul>	Same as for asphalt roads.	Same as for brick and stone roads.
<b>Buildings, bunkers, gun emplacements, tank obstacles</b>	Same as for brick and stone buildings.	Same as for brick and stone buildings.	Same as for brick and stone buildings.
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Surface or Material	Type of Contamination		
	Chemical	Biological	Nuclear
Earth: Roads (Applicable to small vital areas only), gun emplacements, bivouac areas, pathways, bomb craters	<ul style="list-style-type: none"> <li>● Spray with slurry from PDDE.</li> <li>● Cover with STB; when liquid contamination is visible and personnel are nearby, use dry mix.</li> <li>● Weather.</li> <li>● Burn (may present downwind vapor hazard).</li> <li>● Cover small areas or paths across roads with 10 cm (4 inches) of earth.</li> <li>● Scrap layer of contaminated earth to side or road.</li> </ul>	<ul style="list-style-type: none"> <li>● Same as for asphalt roads</li> <li>● Burn.</li> </ul>	<ul style="list-style-type: none"> <li>● Earthmoving (removal). Contaminated dust should be controlled. Equipment may become contaminated. Waste disposal must be considered.</li> <li>● Sealing (with earth). No waste disposal problem; however, equipment may become contaminated.</li> </ul>
Fabrics: Canvas, covers, tarpaulins, tentage, mask carriers, web gear, clothing	<p>Cotton</p> <ul style="list-style-type: none"> <li>● Immerse in boiling soapy water for 1 hr (1 lb soap to 10 gal water; stir).</li> <li>● Use 5% solution of sodium carbonate for G agents.</li> <li>● Immerse in boiling water for 1 hr.</li> <li>● Launder by standard methods.</li> <li>● Use slurry.</li> <li>● Weather (except for V agents).</li> </ul> <p>Woolen (DS2 not recommended) Immerse in warm (100°F, soapy water for 1 hr or longer with light agitation; dry items slowly (fabric may shrink))</p>	<p>Cotton</p> <ul style="list-style-type: none"> <li>● boil in water for 15 minutes.</li> <li>● Autoclave for 45 minutes at 123°C (253°F).</li> <li>● Immerse in 2% household bleach solution for 30 minutes, rinse immediately.</li> <li>● Launder (destroys or inactivates all but highly resistant spores).</li> </ul> <p>Woolen (DS2 not recommended). Launder (fabric may shrink).</p>	<p>Cotton and Woolen (DS2 not recommended for woolen).</p> <ul style="list-style-type: none"> <li>● Brushing (removes contaminated dust, but presents dust hazard to personnel).</li> <li>● Laundering (most practical procedure; waste must be controlled; fabric may shrink).</li> </ul>
Leather: Boots, gloves, and other items	<ul style="list-style-type: none"> <li>● scrub with hot, soapy water and rinse.</li> <li>● Immerse in soapy water at 120°F for 4 hrs and rinse.</li> <li>● Use 5% sodium carbonate solution for G agents.</li> <li>● Air.</li> </ul>	<ul style="list-style-type: none"> <li>● Immerse in 2% household bleach solution. Rinse.</li> <li>● Immerse in 2% peracetic acid for 10 minutes, rinse, and air for 10 to 50 minutes.</li> <li>● Wipe with 2% peracetic acid, remove excess, and air 10 to 15 minutes.</li> </ul>	<ul style="list-style-type: none"> <li>● Brushing</li> <li>● Flushing with water or soapy water.</li> </ul>
Glass: Windows	<ul style="list-style-type: none"> <li>● Decon kit, individual equipment.</li> <li>● M258A1 or M280 kit.</li> <li>● DS2.</li> <li>● Wash with hot, soapy water.</li> <li>● Wash with clear water or organic solvent.</li> <li>● Blot off surface.</li> <li>● Air.</li> <li>● Weather</li> </ul>	<ul style="list-style-type: none"> <li>● M258A1 or M280 kit.</li> <li>● Wash with soap and water.</li> <li>● Wipe with disinfectant solution or 2% peracetic acid (see similar procedures below for mess gear).</li> </ul>	<ul style="list-style-type: none"> <li>● M258A1 or M280 kit.</li> <li>● Wash with detergent.</li> <li>● Flush with water.</li> <li>● Wipe with solvents.</li> </ul>
Lenses	<ul style="list-style-type: none"> <li>● M258A1 or M280 kit.</li> <li>● Same as for windows (DS2 may damage lens coatings).</li> <li>● Decon kit, individual equipment.</li> </ul>	<ul style="list-style-type: none"> <li>● M258A1 or M280 kit.</li> <li>● Wipe with soap and water.</li> <li>● Wipe with alcohol or household bleach.</li> </ul>	<ul style="list-style-type: none"> <li>● M258A1 or M280 kit.</li> <li>● Brush or wipe (care must be exercised to prevent scratching of lens).</li> <li>● Use compressed air to blow contamination from surface.</li> </ul>
Grass and Low Vegetation: Fields, open terrain	<ul style="list-style-type: none"> <li>● Burn.</li> <li>● Spray with slurry from PDDE.</li> <li>● Cover with STB or dry mix.</li> <li>● Explode drums of STB.</li> <li>● Clear paths through area by use of detonating cord or other detonating devices.</li> </ul>	<ul style="list-style-type: none"> <li>● Burn.</li> <li>● Same as for asphalt roads.</li> </ul>	Same as for earth.
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Surface or Material	Type of Contamination		
	Chemical	Biological	Nuclear
Metals (unpainted): Ammunition	<ul style="list-style-type: none"> <li>● Wipe with soapy water.</li> <li>● Wipe with organic solvent and dry.</li> <li>● Air.</li> </ul>	<ul style="list-style-type: none"> <li>● Wipe with soapy water.</li> <li>● Wipe with 2% household bleach solution.</li> <li>● Air.</li> </ul>	<ul style="list-style-type: none"> <li>● Brush or wipe.</li> </ul>
Machinery	<ul style="list-style-type: none"> <li>● Use DS2.</li> <li>● Same as for ammunition.</li> </ul>	<ul style="list-style-type: none"> <li>● Use DS2.</li> <li>● Wipe with 2% peracetic acid, rinse, and air for 10 to 15 minutes.</li> </ul>	<ul style="list-style-type: none"> <li>● Brush or wipe.</li> <li>● Wash with detergent.</li> <li>● Flush with water.</li> </ul>
Mess gear and canned rations	<ul style="list-style-type: none"> <li>● Immerse in boiling, soapy water for 30 minutes and rinse.</li> <li>● Immerse in boiling water for 30 minutes.</li> <li>● Spray with DS2.</li> <li>● Wash in hot, soapy water, rinse, and air.</li> </ul>	<ul style="list-style-type: none"> <li>● Wash with soap and water, then immerse in disinfectant solution (disinfectant, chlorine, food service, or 1/3 canteen cup of household bleach per 10 gal water).</li> <li>● Boil in water 15 minutes. (Not effective on toxins and bacterial spores.) Immerse in 5% sodium carbonate (4 lb washing soda to 10 gallons water), rinse with potable water.</li> <li>● Immerse in household bleach solution (1/2 gal bleach to 25 gal water) for 30 minutes, then rinse and air for 10 to 15 minutes.</li> <li>● Immerse in HTH solution (1/2 lb to 25 gal water) 30 minutes, then rinse.</li> <li>● Immerse in STB solution (1 lb to 25 gal water) for 30 minutes, then rinse.</li> <li>● Immerse in 2% peracetic acid for 10 minutes, rinse, and air for 10 to 15 minutes.</li> </ul>	<ul style="list-style-type: none"> <li>● Wash with soap and water, rinse.</li> <li>● Brush, wipe contamination from surfaces and containers.</li> </ul>
Metals (painted): Vehicles, weapons, equipment	<ul style="list-style-type: none"> <li>● DS2 (may soften paint).</li> <li>● Wash with hot, soapy water and rinse.</li> <li>● Spray with slurry from PDDE, remove from surface in 1 hour and oil surface.</li> <li>● Weather.</li> <li>● Air.</li> <li>● M291 kit may be used for individual weapon decon.</li> <li>● M280 (DKIE) decon kit, individual equipment.</li> </ul>	<ul style="list-style-type: none"> <li>● Wash with detergent and high-pressure water stream.</li> <li>● Apply detrochlorite. Leave on 30 minutes, then remove by washing with a stream of water.</li> <li>● Steam clean, using detergent.</li> <li>● Use household bleach solution.</li> <li>● Use 2% peracetic acid.</li> </ul>	<ul style="list-style-type: none"> <li>● Brush or wipe.</li> <li>● Wash.</li> <li>● Use organic solvents, caustics (not on aluminum or magnesium surfaces), complexing agents (of small value on weathered surfaces), or abrasives.</li> </ul>
Plastics (opaque): Insulation, telephones, panel boards.	<ul style="list-style-type: none"> <li>● DS2 (may soften or damage some plastics).</li> <li>● Wash with hot, soapy water and rinse.</li> <li>● Weather.</li> <li>● Air.</li> </ul>	Same as for lenses	<ul style="list-style-type: none"> <li>● Wash with detergents.</li> <li>● Flush with water.</li> <li>● Wipe or brush.</li> </ul>
Plastics (transparent): Eyepieces, airplane canopies	<ul style="list-style-type: none"> <li>● Wash with hot, soapy water and rinse.</li> <li>● Weather.</li> <li>● Air.</li> <li>● Blot off surface.</li> </ul>	Same as for lenses.	Same as for plastics (opaque).
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Surface or Material	Type of Contamination		
	Chemical	Biological	Nuclear
Rubber (impermeable): Aprons, suits, and other items	<ul style="list-style-type: none"> <li>● Spray with DS2 and rinse after 30 minutes.</li> <li>● Immerse in hot, soapy water (just below boiling point) for 1 hour; do not agitate. Rinse with clear water and hang up to dry.</li> <li>● For G agents, use 10% sodium carbonate solution, rinse, and air.</li> <li>● Apply hot, soapy water with brushes and rinse.</li> <li>● Spray with slurry from PDDE.</li> <li>● After a few minutes, wash off with clear water.</li> </ul>	Same as for leather.	<ul style="list-style-type: none"> <li>● Brushing.</li> <li>● Scrubbing or flushing with water or soapy water.</li> </ul>
Rubber (natural and synthetic): Gloves, boots	<ul style="list-style-type: none"> <li>● Spray with 10% mixture of HTH and rinse.</li> <li>● Immerse in slurry solution for 4 hours, rinse, and air.</li> <li>● Use the M291 kit in emergencies.</li> <li>● Air.</li> </ul>	Same as for leather.	Same as for impermeable rubber.
Mask facepieces and other rubber articles coming in direct contact with the skin.	<ul style="list-style-type: none"> <li>● USE the M291 kit in emergencies.</li> <li>● Wash with warm, soapy water.</li> <li>● Use decon kit, individual equipment, M280.</li> </ul>	<ul style="list-style-type: none"> <li>● Wash in warm, soapy water; rinse in clear water, and dry at room temperature</li> <li>● Wipe with 2% peracetic acid; wipe off excess immediately, and air 10 to 15 minutes.</li> </ul>	<ul style="list-style-type: none"> <li>● Wipe or brush off.</li> <li>● Wipe off with water and detergent (avoid wetting mask filters).</li> </ul>
Tires, hoses, mats, insulation.	<ul style="list-style-type: none"> <li>● Spray with 10% mixture of HTH and rinse.</li> <li>● Apply slurry paste. Allow slurry to remain at least 30 minutes, then flush with clear water (may be left on tires).</li> <li>● Apply hot soapy water.</li> <li>● Air.</li> <li>● Weather.</li> </ul>	Use same methods used for chemical decon.	Same as for impermeable rubber.
Sand (Applicable to small vital areas only): Beaches, deserts.	<ul style="list-style-type: none"> <li>● Flush with water.</li> <li>● Spread STB or spray slurry over surface.</li> <li>● Weather.</li> <li>● Cover paths with roofing paper.</li> <li>● Scrape off 5 to 10 cm (2 to 4 inches) of contaminated top layer.</li> </ul>	<ul style="list-style-type: none"> <li>● Burn.</li> <li>● Wet with water (will help prevent secondary aerosols, but does not decon).</li> <li>● Apply 2% household bleach solution.</li> <li>● Apply slurry of 7 parts STB and 93 parts water (by weight).</li> <li>● Apply sodium hydroxide.</li> </ul>	Same as for earth.
Undergrowth and tall grass: Meadows, jungles, forests (Applicable to small vital areas only)	<ul style="list-style-type: none"> <li>● Burn (downwind vapor hazard).</li> <li>● Spray slurry from PDDE.</li> <li>● Weather.</li> <li>● Explode drums of STB.</li> <li>● Clear paths with detonating cord, bangalore torpedoes, or demolition snakes.</li> </ul>	<ul style="list-style-type: none"> <li>● Burn.</li> <li>● Same as for sand.</li> </ul>	To extent possible, use same procedures as for earth.
Wood (unpainted): Buildings, vehicle bodies, boxes, crates, and similar items	<ul style="list-style-type: none"> <li>● Apply slurry with PDDE, brooms, or swabs. Let slurry remain 12 to 24 hours; flush and repeat application, then flush again.</li> <li>● Scrub with hot, soapy water and rinse.</li> <li>● Weather.</li> </ul>	<ul style="list-style-type: none"> <li>● Apply detrochlorite. Leave on at least 30 minutes; flush with water.</li> <li>● Apply STB slurry to vertical surfaces. Slurry may be left on interiors.</li> <li>● Weather (sun and rain eliminate most microorganisms within one day).</li> <li>● Burn.</li> </ul>	<ul style="list-style-type: none"> <li>● Planning.</li> <li>● Wash exterior with large amounts of water (some contamination may soak into surfaces).</li> </ul>
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Surface or Material	Type of Contamination		
	Chemical	Biological	Nuclear
Wood (painted surface): (DS2 may soften paint). Buildings, boxes	<ul style="list-style-type: none"> <li>● Apply slurry with PDDE, brooms, or swabs. Let slurry remain 12 to 24 hours, then rinse off with water.</li> <li>● Scrub with hot water and rinse. Use DS2 and rinse.</li> <li>● Weather.</li> </ul>	Same as for wood buildings and boxes as previously indicated .	<ul style="list-style-type: none"> <li>● Wash exterior with large amounts of water.</li> <li>● Wipe contamination from surface.</li> </ul>
Water	Decon of water should only be undertaken by trained water purification personnel.	<ul style="list-style-type: none"> <li>● Boil small amounts 15 minutes.</li> <li>● Chlorinate using chlorination kit.</li> <li>● Add iodine water purification tablets to small amounts of water.</li> </ul>	<ul style="list-style-type: none"> <li>● Flocculation (requires special chemicals to remove suspended matter in water).</li> <li>● Ion exchange (removes radioions from solution).</li> </ul>
Food: Not canned or protected by impermeable container	Food known or suspected to be contaminated with chemical agents should not be consumed until approved by veterinary personnel.	<ul style="list-style-type: none"> <li>● Boil in water 15 minutes. Cook thoroughly.</li> <li>● Immerse in or spray with 2% household bleach solution. (Pack - aged food or food which is peeled or pared may be immersed or sprayed.)</li> </ul>	Wash or trim contamination from unpackaged food.
Food: Canned, bottled, or protected by impermeable container	See mess gear and canned rations.	See mess gear and canned rations.	See mess gear and canned rations.
Personnel	<ul style="list-style-type: none"> <li>● Use M291 kit on exposed skin known or suspected to be contaminated; decon kit, individual equipment, M280.</li> <li>● Bathe with soap and water if readily available.</li> </ul>	<ul style="list-style-type: none"> <li>● Bath with soap and hot water; decon kit individual equipment, M280.</li> <li>● Use the M291 kit.</li> </ul>	<ul style="list-style-type: none"> <li>● Brush or wipe from skin and hair.</li> <li>● Bathe with soap and hot water.</li> </ul>